

Claims

1. A process for the treatment of a paper making pulp, the process comprising the following steps: a) an alkaline treatment of the pulp, b) a treatment of the pulp with a pectin lyase, a pectate lyase, or a combination of a pectate lyase and a pectinesterase.
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2. The process of claim 1, wherein
 - (i) the pectate lyase treatment follows the alkaline treatment step;
 - (ii) the pectate lyase treatment is followed by the alkaline treatment step;
 - 10 (iii) the pectin lyase treatment is followed by the alkaline treatment step;
 - (iv) the treatment with a combination of pectate lyase and pectinesterase is followed by the alkaline treatment step; or
 - (v) the treatment with a combination of pectate lyase and pectinesterase follows the alkaline treatment step.
- 15 3. The process of anyone of the preceding claims, further comprising step c) a draining of the pulp.
4. The process of claim 3 which is a process for making a paper material.
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5. The process of any one of the preceding claims, wherein the enzyme treatment of step b) leads to the formation of unsaturated oligomers with a 4,5 carbon-carbon double bond in the non-reducing end, resulting in degradation products exhibiting a distinct UV absorbance at 235 nm.
- 25 6. The process of any one of claims 3-5, wherein step c) follows steps a) and b).
7. The process of any one of the preceding claims, which comprises at least one of the following additional steps: d) debarking, e) chipping, f) refining, g) screening, h) cleaning, i) thickening, j) storage, k) forming the paper material, and/or l) drying the paper material.
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8. The process of any one of the preceding claims, wherein the alkaline treatment is a hydrogen peroxide or hydrosulphite bleaching, or a repulping of recycled pulp.

9. The process of any one of the preceding claims, wherein the pulp is additionally treated with a polygalacturonase and/or a pectate disaccharide-lyase.

10. The process of any one of the preceding claims, wherein the enzymes are added to
5 wash water, white water, process water, and/or drained water.

11. The process of any one of the preceding claims, wherein the enzymes are added together with complexing agents and/or surfactants.

10 12. A method of reducing the cationic demand and/or the content of anionic trash in a pulp, the method comprising the steps of a) an alkaline treatment of the pulp, b) a treatment of the pulp with i) a xylanase, and/or ii) a pectin lyase, a pectate lyase, or a combination of a pectate lyase and a pectinesterase.

15 13. The method of claim 12, wherein
(i) the pectate lyase treatment follows the alkaline treatment step;
(ii) the pectate lyase treatment is followed by the alkaline treatment step;
(iii) the pectin lyase treatment is followed by the alkaline treatment step;
(iv) the treatment with a combination of pectate lyase and pectinesterase is followed by the
20 alkaline treatment step;
(v) the treatment with a combination of pectate lyase and pectinesterase follows the alkaline treatment step;
(vi) the xylanase treatment follows the alkaline treatment step; and/or
(vii) the xylanase treatment is followed by the alkaline treatment step.

25 14. The method of any one of claims 12-13, wherein step b) includes a treatment of the pulp with a pectinase.

15. Use of a xylanase, a pectate lyase, a pectin lyase, and/or the combination of a pectate
30 lyase and a pectin esterase in a pulp for anionic trash reduction and/or reduction of cationic demand.

16. The use of claim 15 further comprising the use of a pectinase.